



## STATE OF HAWAII DEPARTMENT OF HEALTH

### **Facts About Viral Hemorrhagic Fevers**

Viral hemorrhagic fevers (VHFs) refer to a group of illnesses that are caused by several distinct families of viruses. In general, the term "viral hemorrhagic fever" is used to describe a severe viral illness characterized by a high fever, bleeding problems, and death from failure of multiple organs of the body. While some types of hemorrhagic fever viruses can cause relatively mild illnesses, many cause severe, life-threatening diseases.

VHFs are caused by viruses of four distinct families: arenaviruses, filoviruses, bunyaviruses, and flaviviruses. Each of these families shares a number of features:

- Their survival is dependent on an animal or insect host, called the natural reservoir.
- The viruses are geographically restricted to the areas where their host species live.
- Humans are not the natural reservoir for any of these viruses. Humans are infected when they come into contact with infected hosts. However, with some viruses, after the accidental transmission from the host, humans can transmit the virus to one another.
- Human cases or outbreaks of hemorrhagic fevers caused by these viruses occur sporadically and irregularly. The occurrence of outbreaks cannot be easily predicted.
- With a few noteworthy exceptions, there is no cure or established drug treatment for VHFs.

Viruses associated with most VHFs are zoonotic meaning that these viruses usually live and infect animals or insects. For the most part, rodents such as rats and mice are the animal hosts and arthropods such as ticks and mosquitoes are the vectors that spread the illness from animal to animal or animal to human. The hosts of some viruses remain unknown -- Ebola and Marburg viruses are well-known examples.

The viruses that cause VHFs are distributed over much of the globe. However, because each virus is associated with one or more particular host species, the virus and the disease it causes are usually seen only where the host species live(s). Therefore, the risk of getting VHFs caused by these viruses is restricted to those areas. For viruses whose host animal is found on several continents, the resulting viral illness occurs more widespread such as hantavirus pulmonary syndrome (HPS) in North and South America.

Occasionally people become infected by a host that has been exported from its native habitat. For example, the first outbreaks of Marburg hemorrhagic fever, in Marburg and Frankfurt, Germany, and in Yugoslavia, occurred when laboratory workers handled imported monkeys from Africa infected with Marburg virus. A person infected in an area where the virus occurs naturally can travel to another part of the world, and infect others if person-to-person transmission occurs.

Viruses causing hemorrhagic fever are initially transmitted to humans when the activities of infected reservoir hosts or vectors and humans overlap. The viruses carried in rodent reservoirs are transmitted when humans have contact with urine, fecal matter, saliva, or other body

excretions from infected rodents. The viruses associated with arthropod vectors are spread most often when the vector mosquito or tick bites a human, or when a human crushes a tick. Humans can become infected if they care for or slaughter animals infected by the VHF virus.

Transmission of a VHF virus person-to-person is called secondary transmission. This occurs when noninfected people have close contact with those infected or the body fluids of someone infected. Ebola, Marburg, Lassa, and Crimean-Congo VHFs can have secondary transmission.

Specific signs and symptoms vary by the type of VHF, but often include marked fever, fatigue, dizziness, muscle aches, loss of strength, and exhaustion. Patients with severe cases of VHF often develop bleeding problems causing bruising and bleeding from body orifices such as the mouth, nose, or rectum. Severely ill patient cases may also show shock, nervous system malfunction, coma, delirium, and seizures.

Patients receive supportive therapy, but generally speaking, there is no other treatment or established cure for VHFs. Ribavirin, an anti-viral drug, has been effective in treating some individuals with Lassa fever. Treatment with plasma (the part of the blood that does not contain blood cells) donated by persons who survived VHF has been used with success in some patients with Argentine hemorrhagic fever.

With the exception of yellow fever and Argentine hemorrhagic fever, no vaccines exist that can protect against these diseases. Therefore, prevention efforts must concentrate on avoiding contact with host species. If prevention methods fail and a case of VHF does occur, efforts should focus on preventing further transmission from person to person. Because many of the hosts that carry hemorrhagic fever viruses are rodents, disease prevention efforts include:

- controlling rodent populations;
- discouraging rodents from entering or living in homes or workplaces;
- encouraging safe cleanup of rodent nests and droppings.

For hemorrhagic fever viruses spread by arthropod vectors, prevention efforts often focus on community-wide insect and arthropod control. In addition, people are encouraged to use insect repellent, proper clothing, mosquito netting over beds, window screens, and other insect barriers to avoid being bitten.

To prevent person to person spread, close contact between infected and noninfected people must be avoided. Infection control techniques such as isolation of patients and their body fluids and barrier protection (masks, gowns, gloves, and eye protection) of medical personnel should be employed. Medical instruments and equipment used in care of VHF patients should be carefully disinfected or disposed of to avoid the spread of disease.